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REMARKS

In view of the foregoing amendments and the following remarks, reconsideration and allowance are requested.

Claims 1-35 are pending, with Claims 1, 13, 30 and 33 being independent.

Claims 1-6, 9, 13, 15-16, 27, 30-35 stand rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Suzuki et al. (U.S. Patent No. 5,521,619). This contention is respectfully traversed.

Claims 1-27, 29, 30-31, and 33-35 stand rejected under 35 U.S.C. 103(a) as allegedly being anticipated by Murakami et al. (U.S. Patent No. 4,563,689) in view of Suzuki. This contention is respectfully traversed.

Claim 28 stands rejected under 35 U.S.C. 103(a) as allegedly being anticipated over Suzuki in view of Imanaka et al. (U.S. Patent No. 6,467,863) and Butterfield et al. (U.S. Patent No. 6,685,297). This contention is respectfully traversed.

35 U.S.C. 102 Rejections

Claim 1

Amended Claim 1 is patentable over Suzuki, inter alia, because Suzuki fails to anticipate each and every feature of the claim as arranged in the claim. For a claim to be anticipated by the prior art, it is necessary that a single prior art reference disclose each element of the claim under consideration. *Minnesota Mining and Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1565 (Fed. Cir. 1992).

Among other things, Suzuki fails to disclose the features of "wherein each of said plurality of droplet ejection devices is configured for individual control of charge accumulation on respective said capacitances and for individual control of the extent of change in charge on respective said capacitances." The amendments made to Claim 1 are not new subject matter and are supported in the specification. For example, the amendments to Claim 1 are supported in page 3, lines 27-30 of the specification:

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"One can also individually control the charge on devices, the slope of the change in charge, and the timing and slope of discharge to achieve various effects such as uniform droplet volume or velocity and gray scale control."

Suzuki discloses a device that generates an ink drop on a medium when a meniscus of a recording apparatus comes into a predetermined state independently of the vibration of the pressure generating chamber and the vibration associated with the ink (Suzuki: Abstract; Col. 5, lines 30-35). Suzuki fails to disclose the above-recited feature of Claim 1. Instead, Suzuki discloses that a number of piezoelectric vibrators 8 (Figs. 5 and 7) all receive the same input from the same driving signal generating circuit 49. Although each piezoelectric vibrator 8 can be turned on or off in a binary manner, all of the piezoelectric vibrators 8 receive the same input from the same driving signal generating circuit 49, and thus receive the same input waveform with a slope that is common to all of the piezoelectric vibrators 8 (Suzuki: Figs. 5, 7; Col. 7, lines 47-54; Col. 8, lines 10-18). Therefore, Suzuki fails to disclose "wherein each of said plurality of droplet ejection devices is configured for individual control of charge accumulation on respective said capacitances and for individual control of the extent of change in charge on respective said capacitances," as recited in Claim 1. Therefore, Suzuki fails to anticipate the features of Claim 1.

Furthermore, Fig. 3 of Suzuki fails to disclose the "individual control of the extent of change in charge on respective said capacitances," as recited in Claim 1. Fig. 3 shows an analog amplifier circuit, in which the capacitor 24 (time constant adjusting capacitor 24) is charged and discharged to generate a waveform, and transistors 29-32 function as a buffer amplifier to drive all of the piezoelectric vibrators 8 at the same time (Suzuki: Fig. 3, Col. 2, lines 12-16, 22-25, 41-62). Therefore, there is no "individual control of the extent of change in charge on the respective said capacitances" in Suzuki. Instead, Suzuki discloses that the capacitor 24 is employed to ensure that the charging within the amplifier circuit occurs at a constant rate (i.e., the RC time constant will ensure that the slope of the voltage change within the amplifier itself is constant before being sent to the buffer transistors 29-32) (Suzuki: Col. 3, lines 8-27). The time constant adjusting capacitor 24 of the amplifier in Suzuki is not a piezoelectric capacitor. Furthermore, the time constant adjusting capacitor 24 is decoupled from the piezoelectric capacitor via the buffer transistors 29-32. Hence, Claim 1 is patentably distinct over Suzuki.

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Moreover, Suzuki also fails to disclose or suggest other elements recited in Claim 1. For example, Claim 1 recites that “each said droplet device” includes (1) “a fluid chamber having a volume and an ejection nozzle,” (2) “an electrically actuated displacement device,” and (3) “a first switch” in a specified connection. Figs. 1-3 of the specification support this claim feature in showing ink jet components associated with “each individual droplet ejection device” (e.g., Instant Disclosure: Figs. 1-3; page 4, lines 19-30; page 5, lines 1-13). Suzuki shows in Figs. 5 and 7, however, that the all of the piezoelectric vibrators 8 share the same input connection, driving signal generating circuit 49, and print timing signal 42. Furthermore, Suzuki fails to disclose that each the piezoelectric vibrators 8 has a switch in the connection arrangement as specified in Claim 1. Also, Suzuki fails to show that a separate switch is connected to each of the inputs of the piezoelectric vibrators 8. Therefore, Claim 1 is further patentable over Suzuki for these reasons.

For at least the reasons discussed above, the rejection under 35 U.S.C. 102 to Claim 1 should be withdrawn.

Claims 13, 30 and 33

The amended independent Claims 13, 30, and 33 recite patentable subject matter, for example, patentable subject matter similar to Claim 1 as described above. Therefore, Claims 13, 30, and 33 are all patentable over Suzuki for at least the same reasons as Claim 1. The Applicants request that these claims be allowed.

Claims 2-6, 9, 15-16, 27, 31-32, 34-35

The amended dependent Claims 2-6, 9, 15-16, 27, 31-32, 34-35 are all patentable over Suzuki at least for relying on patentable subject matter in a base claim.

35 U.S.C. 103 – Claims 1-31 and 33-35

Claims 1-27, 30-31 and 33-35 are all patentable over Suzuki and Murakami, alone or in combination, at least because the references, as suggested by the office action, fail to teach or suggest each and every feature of the claims.

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Claim 1

Amended Claim 1 is patentable over Suzuki at least because Suzuki fails to teach or suggest the features of the claim as described above with respect to Claim 1. Murakami fails to remedy the deficiencies of Suzuki. For example, Murakami teaches an ink jet recording apparatus where a preceding pulse is applied to a transducer prior to the main pulse to control a position of the ink meniscus in the nozzle and to control the ink droplet size (Murakami: Abstract). Murakami shows a circuit (Fig. 12) that controls a single piezoelectric crystal 8 (Murakami: Col. 10, lines 9-68). However, Murakami fails to teach or suggest that "each of said plurality of droplet ejection devices is configured for individual control of charge accumulation on respective said capacitances and for individual control of the extent of change in charge on respective said capacitances," as recited in Claim 1. Murakami is silent on these features. Therefore, Claim 1 is patentable over Suzuki and Murakami for this reason and the reasons described above with respect to Claim 1.

Moreover, the suggested combination of Murakami and Suzuki would render the prior art device being modified unsuitable for its intended purpose. If a proposed modification would render the prior art device being modified unsuitable for its intended purpose, the proposed modification would not have been obvious. *Tec Air Inc. v. Denso Mfg. Michigan Inc.*, 192 F.3d 1353,1360, (Fed. Cir. 1999); *Gordon*, 733 F.2d at 902. Murakami discloses that, after the charging switch is electrically disconnected from the capacitor, the charge leaves the piezoelectric crystal (capacitor) via a shunt resistor to ground (see shunt resistor connected in parallel with the piezoelectric crystal in Murakami for Figs. 5, 7, 10a, 10b, and 12). However, if this shunt resistor is added to the piezoelectric vibrator 8 circuit of Suzuki, then Suzuki will not be able to store charge on the capacitors (Suzuki: Figs. 5-7, Col. 7, lines 47-54). Therefore, Claim 1 is not obvious in light of the suggested combination of Murakami and Suzuki, and the rejection under 35 U.S.C. 103 must be withdrawn.

Claims 13

The amended independent Claim 13 recites patentable subject matter similar to Claim 1, as described above. Therefore, Claim 13 is patentable over Suzuki and Murakami, alone or in

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combination, for at least the same reasons as Claim 1. The Applicants request that this claim be allowed.

Claims 30 and 33

The amended independent Claims 30 and 33 recite patentable subject matter, for example, as described above with respect to the individual control. Therefore, Claims 30 and 33 are all patentable over Suzuki and Murakami, alone or in combination, for at least reciting the individual control. Claim 30 is also patentable for reciting the individual generation of an actuated condition for each actuator. The Applicants request that these claims be allowed.

Claims 2-12, 14-27, 29, 31-32, 34-35

The amended dependent Claims 2-12, 14-27, 29, 31-32, 34-35 are all patentable over Suzuki and Murakami, alone or in combination, at least for relying on patentable subject matter in a base claim.

Claim 28

Claim 28 is patentable over Suzuki and Imanaka and Butterfield, alone or in combination, at least because the references, as suggested by the office action, fail to teach or suggest each and every feature of the claims. In particular, Claim 28 is patentable over the suggested combination at least because Claim 28 relies upon patentable subject matter in a base claim, base Claim 1 or 13. Imanaka and Butterfield fail to remedy the deficiencies of Suzuki. For example, Butterfield teaches a method of aligning print heads in a print head unit (Butterfield: Abstract), and Imanaka teaches an ink jet recording head that inhibits the bluntness of a pulse waveform by the transmission of a signal via a cable and the associated cable radiation noise (Imanaka: Abstract, Col. 3, lines 62-67; Col. 4, lines 1-2). Imanaka and Butterfield fail to teach or suggest patentable subject matter that would remedy the above-mentioned deficiencies of Suzuki. Therefore, the rejection under 35 U.S.C. 103 should be withdrawn.

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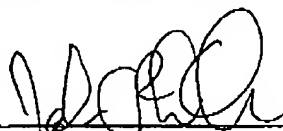
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Conclusion

In view of the amendments and remarks herein, Claims 1-35 are in condition for allowance and ask that these pending claims be allowed. The foregoing comments made with respect to the positions taken by the Examiner are not to be construed as acquiescence with other positions of the Examiner that have not been explicitly contested. Accordingly, Applicants' arguments for patentability of a claim should not be construed as implying that there are not other valid reasons for patentability of that claim or other claims.

No fee is believed due at this time. Please apply any other charges or credits to deposit account 06-1050.

Respectfully submitted,



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Date: December 6, 2005

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